Acute Myocardial Infarction National Project Overview

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Over 300,000 Medicare patients are hospitalized for heart attack (acute myocardial infarction) each year. Many do not receive important therapies that are known to be beneficial. The National Acute Myocardial Infarction Project focuses on strengthening appropriate care processes to improve patient outcomes. The goal is to lower the one-year mortality rate for Medicare beneficiaries following hospital admission for heart attack.

Public Health Importance

Cardiovascular disease is America's biggest killer. Every minute an American dies of coronary heart disease. Each year approximately 1.1 million people experience an acute myocardial infarction (AMI) or heart attack. Almost two-thirds of heart attack patients do not make a complete recovery and people who survive the acute phase have a chance of related illness and death that is 2 to 9 times higher than that of the general population. One third dies during the acute phase. Older Americans bear the brunt of this medical burden. Over 80 percent of all heart attack related deaths occur in individuals age 65 or older.[1]

Heart disease is the leading cause of hospitalization among persons age 65 or older. Acute myocardial infarction accounts for approximately 394,850 hospitalizations for Medicare beneficiaries, or about 12 hospitalizations for every 1,000 enrollees. The payments to hospitals for these episodes totaled over $3.6 billion, or about $9,780 per discharge, in 1996.[2]

Main Objective

To lower the one-year mortality rate for Medicare beneficiaries following hospital admission for AMI. Specifically, to decrease the one-year mortality from 31.4 percent (based on hospital admissions for heart attack from August 1995 to July 1996) to 27.4 percent over 5 years. This represents a decrease of 1 percentage point more than the background trend.

Process Objectives

To increase the use of the following care processes for patients hospitalized with AMI:

- Early administration of aspirin
- Early administration of beta-blocker
- Timely initiation of reperfusion therapy (using a thrombolytic agent or angioplasty)
- Aspirin prescribed at discharge

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AMI Quality Indicators

Quality Indicators	*Criterion Met or Acceptable Alternative**
1. Early administration of aspirin	1. Within 24 hours of hospital arrival
2. Early administration of beta-blocker	2. Within 24 hours of hospital arrival
3. Timely reperfusion	3. Interval from time of arrival to initiation of thrombolysis or primary angioplasty
4. Aspirin at discharge	4. Evidence of prescription upon hospital discharge
5. Beta-blocker at discharge	5. Evidence of prescription upon hospital discharge
6. ACE inhibitor at discharge for low LVEF	6. Evidence of prescription upon hospital discharge
7. Smoking cessation counseling	7. Documentation of counseling in medical record
Test Indicators	***Criterion Met or Acceptable Alternative***
1. Administration of reperfusion therapy	1. Receipt of thrombolysis or primary angioplasty
2. Early administration of ACE inhibitor	2. *Under development*
3. Cholesterol status assessment and management	3. *Under development*
4. Dietary counseling	4. *Under development*

**Excludes patients with contraindications*

Process Objectives (continued)

- Beta-blocker prescribed at discharge
- Angiotensin-converting enzyme (ACE) inhibitor prescribed at discharge if left ventricular ejection fraction (LVEF) is impaired
- Smoking cessation counseling during hospitalization.

The project also considers other care processes that may decrease mortality after AMI (e.g., early administration of ACE inhibitor, management of hypercholesterolemia); quality indicators are being developed for use in quality improvement efforts.

Clinical Background

Clinical Trials

Multiple clinical trials have demonstrated the efficacy of aspirin, beta-blockers, early reperfusion, and ACE inhibitors for appropriate patients with AMI. For example, in the Second International Study of Infarct Survival (ISIS-2), the early use of aspirin for patients with an evolving myocardial infarction was associated with a 23 percent reduction in short-term mortality.[3] Long-term use of aspirin after an AMI reduces vascular mortality by 13 percent, non-fatal myocardial infarction by 31 percent, and

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Clinical Background *(continued)*

nonfatal stroke by 42 percent, according to a meta-analysis.[4]

The early use of beta-blockers reduced short-term mortality from 4.3 to 3.7 percent in the First International Study of Infarct Survival and from 4.9 to 4.3 percent in the Metoprolol in Acute Myocardial Infarction (MIAMI) trial.[4] Long-term use of beta-blockers after an AMI reduces mortality by 23 percent, according to a meta-analysis.[5]

The use of thrombolytic therapy or primary coronary angioplasty in appropriate patients has been shown to reduce mortality. Earlier treatment improves survival. A benefit of 23 lives saved per 1,000 treated with thrombolytic therapy per hour of earlier treatment has been described.[6] Similarly, in patients treated with primary angioplasty during the first several hours after onset of symptoms, the survival benefit depends on time to reperfusion.[7]

ACE inhibitors, given long-term after an AMI, have been shown to reduce mortality in patients with impaired contractility of the left ventricle. A 20 percent reduction was found in the Survival and Ventricular Enlargement (SAVE) trial, 27 percent reduction in the Acute Infarction Ramipril Efficacy (AIRE) trial, and 22 percent reduction in the Trandolapril Cardiac Evaluation (TRACE) trial.[4] Smoking cessation after AMI decreases mortality. Patients who continue to smoke have a mortality rate that is 1.33 to 2.55 times that of patients who quit.[8]

Clinical Guidelines

The American College of Cardiology and American Heart Association summarized the scientific evidence and published clinical guidelines for the management of AMI in 1996[4] and an update in 1999[9]. The process objectives for HCFA's AMI national project are consistent with recommendations in these guidelines. The quality indicators are not clinical guidelines, but adapt information from the guidelines in order to measure performance.

Opportunity for Improvement

In 1992, HCFA initiated the Cooperative Cardiovascular Project, a quality improvement project focusing on AMI in the Medicare population.[10] The project began as a pilot initiative in 4 states and was subsequently expanded nationally. Data from the Cooperative Cardiovascular Project show that substantial opportunity for improvement in AMI care exists.

As part of the pilot project, time from a patient's arrival at the hospital to initiation of reperfusion therapy using a thrombolytic agent was determined. In 1995, the median time was 41 minutes, and 30 percent received the therapy within 30 minutes.[11] American College of Cardiology and American Heart Association guidelines recommend a goal of less than 30 minutes.[4] In the national project, quality indicator rates were determined for Medicare beneficiaries hospitalized during an approximate 8 month period in 1994 to 1995. Selected quality indicator rates are shown below.[12] Average rates are listed, however, substantial geographic variation exists.[12,13] Patients with contraindications for the therapy are omitted from the analysis. Thus, all patients in the analysis are considered ideal candidates for the therapy, and the target rate for the indicator is 100 percent.

The results indicate that these therapies are substantially underutilized:

- Aspirin administered during the hospital stay, 86 percent
- Aspirin prescribed at discharge from the hospital, 78 percent
- Beta-blocker prescribed at discharge, 50 percent
- ACE inhibitor prescribed at discharge, 59 percent
- Smoking cessation advice given during hospitalization, 42 percent

Increased use of these therapies is associated with improved survival.[11,14] Thus, increased use nationally could potentially save many lives. Achievement of the target objective (of decreasing 1-year mortality to 27.4 percent) would result in approximately 3,000 lives saved per year.

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